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| APPLICATION NO.                                   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/821,843  | 04/12/2004  | Masashi Goto         | 251602US2           | 2942             |
| 22850   | 7590        | 04/03/2007           | EXAMINER            |                  |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. |             |                      | GEYER, SCOTT B      |                  |
| 1940 DUKE STREET                                  |             |                      |                     |                  |
| ALEXANDRIA, VA 22314                              |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2812                |                  |
| SHORTENED STATUTORY PERIOD OF RESPONSE            |             | NOTIFICATION DATE    |                     | DELIVERY MODE    |
| 3 MONTHS  |             | 04/03/2007           |                     | ELECTRONIC       |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/03/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

|                              |                         |                  |  |
|------------------------------|-------------------------|------------------|--|
| <b>Office Action Summary</b> | Application No.         | Applicant(s)     |  |
|                              | 10/821,843              | GOTO ET AL.      |  |
|                              | Examiner<br>Scott Geyer | Art Unit<br>2812 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 January 2007.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-22 is/are pending in the application.  
 4a) Of the above claim(s) 5-10 and 13-22 is/are withdrawn from consideration.  
 5) Claim(s) 1,3 and 11 is/are allowed.  
 6) Claim(s) 2 and 4 is/are rejected.  
 7) Claim(s) 12 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 12 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 060204, 041204.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election with traverse of claims 1-4, 11 and 12 in the reply filed on January 4, 2007 is acknowledged. The traversal is on the ground(s) that the claims appear to be part of an overlapping search area and that a search of all the claims would not be a serious burden upon the examiner. This is not found persuasive because the differing species are drawn to different chemical materials which are not in overlapping search areas, and thus would be a burden on the examiner. The requirement is still deemed proper and is therefore made FINAL.

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

The references cited within the IDS document submitted on April 12, 2004 (paper no. 041204) and June 2, 2004 (paper no. 060204) have been considered.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki et al. (6,323,142).

As to claims 2 and 4, Yamazaki et al. teach a plasma CVD step of forming silicon oxide using TEOS (as the silicon source gas), oxygen and hydrogen (see column 18, lines 14-30). (Yamazaki et al. also teaches using HMDS as a silicon source gas).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 2 is rejected under 35 U.S.C. 102(e) as being anticipated by Choi et al. (2004//0209487 A1).

As to claim 2, Choi et al. teach a method of forming a silicon oxide layer upon a substrate using a silicon compound gas, an oxidizing gas and hydrogen (see paragraph 0026), and the deposition is performed in a plasma chamber.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (2004//0209487 A1) as applied to claim 2 above, and further in view of Lagendijk (5,028,566).

As to claim 4, Choi et al. teaches a method of depositing a silicon oxide film, as noted above for claim 2. Further, Choi et al. teach the oxidizing gas to be oxygen gas or ozone. However, Choi et al. does not teach the silicon compound gas to be tetraethoxy silane gas, tetramethyl cyclo-tetrasiloxane gas, di-acetoxy di-tertiary butoxy silane gas or hexamethyl disiloxane gas. However, Lagendijk teaches a silicon oxide deposition process wherein tetraethoxy silane gas (TEOS) is used (see column 3, lines, 29-47). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Choi et al. by using TEOS as taught by Lagendijk since TEOS has significant safety advantages (as noted by Lagendijk in columns 3 and 4).

#### ***Allowable Subject Matter***

Claims 1, 3 and 11 are allowed.

The following is a statement of reasons for the indication of allowable subject matter. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a method of forming a silicon oxide layer using a plasma chamber with a silicon compound gas, an oxidizing gas and a rare gas, particularly characterized by the rare gas partial

pressure (Pr) being not smaller than 85%, i.e.  $85\% \leq Pr < 100\%$ , as recited in independent claim 1. Claims 3 and 11 are dependent upon claim 1.

(applicant note: dependent claim 5 will be rejoined and also allowed with claim 1, when the application is in condition for allowance).

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Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a method of forming a silicon oxide layer, particularly characterized by the use of a surface wave plasma as noted in dependent claim 12.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Geyer whose telephone number is (571) 272-1958. The examiner can normally be reached on weekdays, between 9:00am - 5:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SCOTT B. GEYER  
PRIMARY EXAMINER

SBG  
March 27, 2007

*SBG* 3/27/07